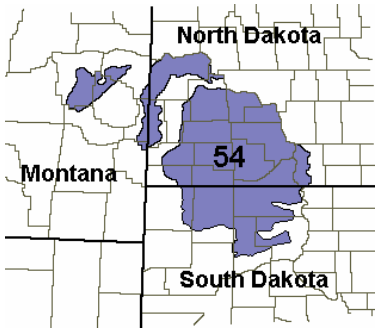
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description

Site Name: Thin Sands



Site Type: Rangeland

Site ID: R054XY034ND

Major Land Resource Area: 54 – Rolling Soft Shale Plain

For more information on MLRA's refer to the following web site:
http://www.essc.psu.edu/soil_info/soil_lrr/

Physiographic Features

This site typically occurs on gently rolling to strongly sloping sedimentary uplands and flood plains.

Landform: dune, natural levee, flood plain

Aspect: NA

	Minimum	Maximum
Elevation (feet):	1600	3600
Slope (percent):	3	50
Water Table Depth (inches):	None	None
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Negligible	Low

Climatic Features

MLRA 54 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 18 inches per year. The normal average annual temperature is about 42° F. January is the coldest month with average temperatures ranging from about 13° F (Beach, ND) to about 16° F (Bison, SD). July is the warmest month with temperatures averaging from about 69° F (Beach, ND) to about 72° F (Timber Lake, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 57° F. This large annual range attests to the continental nature of this MLRA's climate. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

	Minimum	Maximum
Frost-free period (days):	119	136
Freeze-free period (days):	139	157
Mean Annual Precipitation (inches):	14	18

Average Monthly Precipitation (inches) and Temperature (ºF):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.41	0.54	2.2	23.8
February	0.37	0.61	8.7	30.4
March	0.51	1.07	17.1	40.0
April	1.13	1.88	28.9	56.8
May	1.98	2.83	40.5	69.3
June	2.83	3.29	49.8	78.3
July	2.05	2.25	54.6	85.2
August	1.49	2.07	53.0	84.3
September	1.29	1.45	42.0	73.4
October	0.89	1.35	31.6	60.4
November	0.48	0.61	19.0	41.5
December	0.42	0.55	8.1	29.0

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
ND0590	Beach	1949	1999
MT7560	Sidney	1949	1999
SD8307	Timber Lake	1948	1999
ND2183	Dickinson FAA AP	1948	1999

For local climate stations that may be more representative, refer to http://www.wcc.nrcs.usda.gov.

Influencing Water Features

No significant water features influence this site.

Representative Soil Features

The common features of soils in this site are the loamy fine sand and fine sand textured subsoils and slopes of 3 to 50 percent. The soils in this site are somewhat excessively to excessively drained and formed in eolian deposits or alluvium. The loamy fine sand or fine sand surface layer is 4 to 6 inches thick. This site should show slight evidence of wind scoured areas or pedestalled plants. Water flow paths are not evident. The soil surface is unstable and areas of blow-outs can occur.

These soils are susceptible to water and wind erosion. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:

North Dakota http://www.nd.nrcs.usda.gov/
South Dakota http://www.sd.nrcs.usda.gov/
Montana http://www.mt.nrcs.usda.gov/

Parent Material Kind: alluvium, eolian deposits
Parent Material Origin: sedimentary, unspecified
Surface Texture: loamy fine sand, fine sand
Surface Texture Modifier: none
Subsurface Texture Group: sandy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0
Subsurface Fragments > 3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	somewhat excessively	excessively
Permeability Class:	rapid	rapid
Depth to first restrictive layer (inches):	40	72
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	5
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl2)*:	NA	NA
Available Water Capacity (inches)*:	2	4
Calcium Carbonate Equivalent (percent)*:	0	10

* - These attributes represent from 0-40 inches or to the first restrictive layer.

Plant Communities

Ecological Dynamics of the Site:
This site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered quite fragile. Under continued adverse impacts, a rapid decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can slowly return to the Historic Climax Plant Community (HCPC).

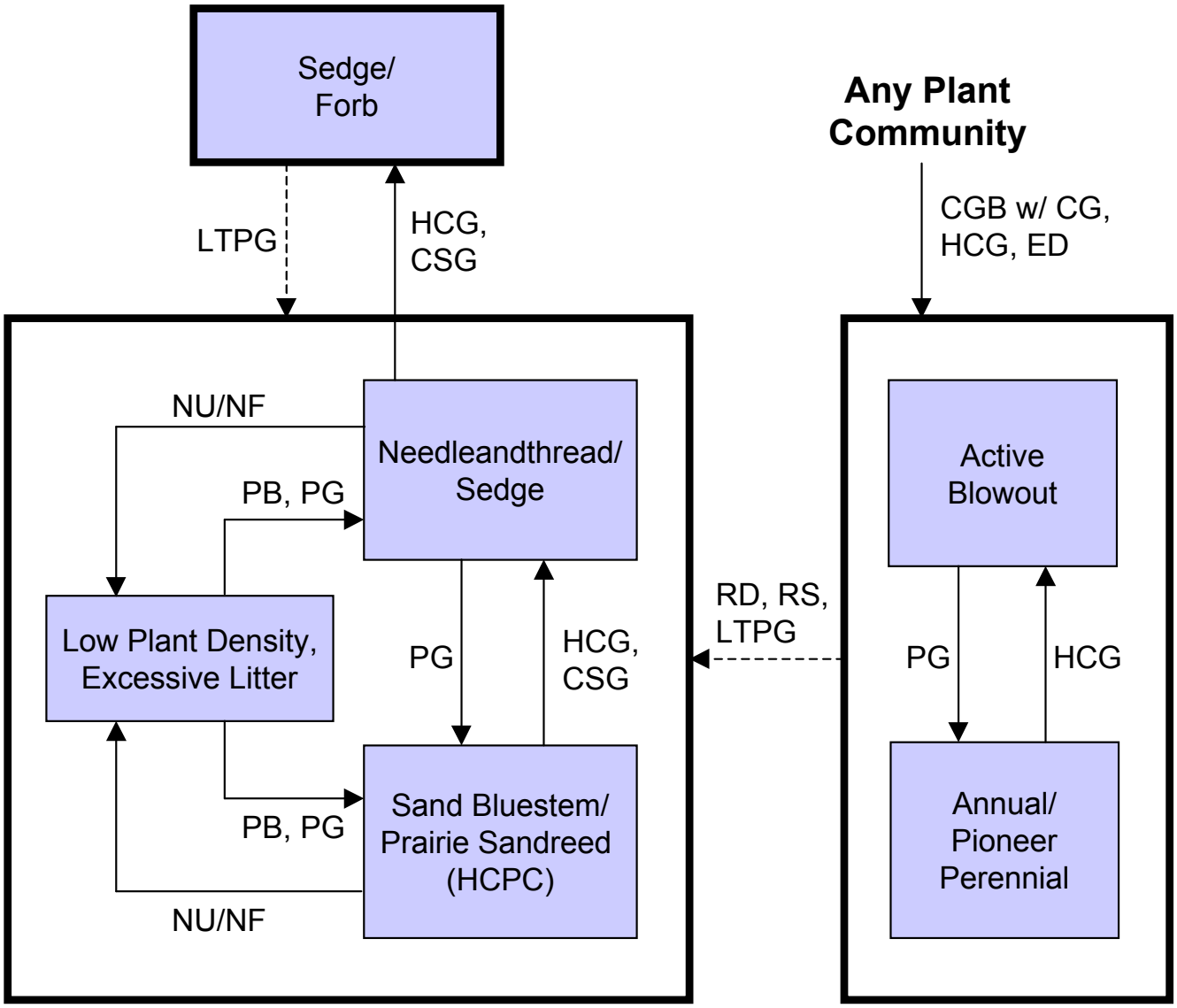
The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Continuous grazing or continuous seasonal (spring) grazing without adequate recovery opportunities following each grazing event during the growing season will initially cause needleandthread, blue grama and threadleaf sedge to increase. Species such as sand bluestem and prairie sandreed decrease in frequency and production. Heavy continuous grazing results in an increased amount of threadleaf sedge and forbs, and elimination of sand bluestem, prairie sandreed and little bluestem.

Non-use (rest) and/or lack of fire will likely cause litter to increase causing decadence, mortality and increased introduced cool-season grasses. Heavy continuous grazing, wildfire, excessive defoliation or any type of physical disturbance can lead to serious erosion problems on these fragile soils (i.e., blowouts).

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CGB w/ CG - cropped go-back with continuous grazing; **CSG** - continuous seasonal grazing; **ED** - excessive defoliation; **HCG** - heavy continuous grazing; **HCPC** - Historical Climax Plant Community; **LTPG** - long-term prescribed grazing; **NU/NF** - extended period of non-use & no fire; **PB** - prescribed burning; **PG** - prescribed grazing; **RD** - removal of disturbance; **RS** - range seeding with prescribed grazing.

Plant Community Composition and Group Annual Production

		Sand Bluestem/Prairie Sandreed (HCPC)		
COMMON/GROUP NAME	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1360 - 1520*	*85 - 95*
BLUESTEM		**1**	**240 - 400**	**15 - 25**
sand bluestem	ANHA	1	240 - 400	15 - 25
little bluestem	SCSC	1	0 - 80	0 - 5
OTHER NATIVE TALL GRASSES		**2**	**160 - 320**	**10 - 20**
prairie sandreed	CALO	2	160 - 320	10 - 20
NEEDLEGRASS		**3**	**160 - 240**	**10 - 15**
needleandthread	HECOC8	3	160 - 240	10 - 15
GRAMA		**4**	**32 - 80**	**2 - 5**
blue grama	BOGR2	4	16 - 80	1 - 5
hairy grama	BOHI2	4	0 - 48	0 - 3
OTHER NATIVE GRASSES		**5**	**80 - 160**	**5 - 10**
Scribner panicum	DIOLS	5	16 - 16	1 - 1
western wheatgrass	PASM	5	16 - 32	1 - 2
sand dropseed	SPCR	5	16 - 16	1 - 1
prairie junegrass	KOMA	5	16 - 32	1 - 2
Indian ricegrass	ACHY	5	16 - 16	1 - 1
false buffalograss	MOSQ	5	0 - 16	0 - 1
plains reedgrass	CAMO	5	0 - 16	0 - 1
Canada wildrye	ELCA4	5	16 - 32	1 - 2
red threeawn	ARPUL	5	16 - 32	1 - 2
other perennial grasses	2GP	5	16 - 32	1 - 2
GRASS-LIKES		**6**	**80 - 160**	**5 - 10**
threadleaf sedge	CAFI	6	80 - 112	5 - 7
Penn sedge	CAPE6	6	32 - 48	2 - 3
horsetail	EQLA	6	16 - 32	1 - 2
other grass-likes	2GL	6	16 - 32	1 - 2
FORBS		*7*	*80 - 160*	*5 - 10*
bracted spiderwort	TRBR	7	32 - 48	2 - 3
bractless blazingstar	MENU	7	0 - 16	0 - 1
eriogonum	ERIOG	7	0 - 16	0 - 1
false gromwell	ONMO	7	0 - 16	0 - 1
gayfeather	LIATR	7	16 - 32	1 - 2
goldenrod	SOLID	7	16 - 32	1 - 2
green sagewort	ARDR4	7	32 - 48	2 - 3
hairy goldaster	HEVI4	7	16 - 32	1 - 2
Indian breadroot	PEES	7	0 - 16	0 - 1
lemon scurfpea	PSLA3	7	16 - 32	1 - 2
penstemon	PENST	7	32 - 48	2 - 3
plains milkvetch	ASGI5	7	0 - 16	0 - 1
prairie coneflower	RACO3	7	0 - 16	0 - 1
purple coneflower	ECAN2	7	0 - 16	0 - 1
rush skeletonweed	LYJU	7	16 - 32	1 - 2
silky prairie clover	DAVI	7	16 - 32	1 - 2
stiff sunflower	HEPA19	7	16 - 32	1 - 2
wavyleaf thistle	CIUN	7	0 - 16	0 - 1
western ragweed	AMPS	7	16 - 16	1 - 1
western wallflower	ERCAC	7	0 - 16	0 - 1
other perennial forbs	2FP	7	16 - 32	1 - 2
SHRUBS		*8*	*32 - 80*	*2 - 5*
cactus	OPUNT	8	0 - 16	0 - 1
creeping juniper	JUHO2	8	16 - 16	1 - 1
fringed sagewort	ARFR4	8	16 - 32	1 - 2
leadplant	AMCA6	8	32 - 48	2 - 3
rose	ROSA5	8	16 - 32	1 - 2
western sandcherry	PRPUB	8	0 - 16	0 - 1
yucca	YUGL	8	16 - 32	1 - 2
other shrubs	2SHRUB	8	0 - 16	0 - 1

Annual Production lbs./acre	LOW	RV	HIGH
GRASSES & GRASS-LIKES	895 -	1424	- 1950
FORBS	75 -	120	- 165
SHRUBS	30 -	56	- 85
TOTAL	1000 -	1600	- 2200

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative Value.

Plant Community Composition and Group Annual Production

		Sand Bluestem/Prairie Sandreed (HCPC)			Needleandthread/Sedge			Sedge/Forb			Low Plant Density, Excessive Litter		
COMMON/GROUP NAME	SYMBOL	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			*1360 - 1520*	*85 - 95*		*440 - 495*	*80 - 90*		*293 - 338*	*65 - 75*		*1050 - 1190*	*75 - 85*
BLUESTEM		**1**	**240 - 400**	**15 - 25**	**1**	**0 - 11**	**0 - 2**	**1**			**1**	**70 - 154**	**5 - 11**
sand bluestem	ANHA	1	240 - 400	15 - 25	1	0 - 6	0 - 1				1	70 - 140	5 - 10
little bluestem	SCSC	1	0 - 80	0 - 5	1	0 - 11	0 - 2				1	0 - 98	0 - 7
OTHER NATIVE TALL GRASSES		**2**	**160 - 320**	**10 - 20**	**2**	**0 - 28**	**0 - 5**	**2**			**2**	**70 - 140**	**5 - 10**
prairie sandreed	CALO	2	160 - 320	10 - 20	2	0 - 28	0 - 5				2	70 - 140	5 - 10
NEEDLEGRASS		**3**	**160 - 240**	**10 - 15**	**3**	**55 - 138**	**10 - 25**	**3**	**23 - 45**	**5 - 10**	**3**	**140 - 210**	**10 - 15**
needleandthread	HECOC8	3	160 - 240	10 - 15	3	55 - 138	10 - 25	3	23 - 45	5 - 10	3	140 - 210	10 - 15
GRAMA		**4**	**32 - 80**	**2 - 5**	**4**	**28 - 44**	**5 - 8**	**4**	**14 - 23**	**3 - 5**	**4**	**14 - 28**	**1 - 2**
blue grama	BOGR2	4	16 - 80	1 - 5	4	17 - 44	3 - 8	4	9 - 23	2 - 5	4	14 - 28	1 - 2
hairy grama	BOHI2	4	0 - 48	0 - 3	4	17 - 44	3 - 8	4	9 - 23	2 - 5	4	14 - 28	1 - 2
OTHER NATIVE GRASSES		**5**	**80 - 160**	**5 - 10**	**5**	**28 - 55**	**5 - 10**	**5**	**23 - 45**	**5 - 10**	**5**	**140 - 210**	**10 - 15**
Scribner panicum	DIOLS	5	16 - 16	1 - 1	5	11 - 28	2 - 5	5	5 - 9	1 - 2	5	14 - 28	1 - 2
western wheatgrass	PASM	5	16 - 32	1 - 2	5	0 - 6	0 - 1				5	14 - 28	1 - 2
sand dropseed	SPCR	5	16 - 16	1 - 1	5	11 - 22	2 - 4	5	23 - 32	5 - 7	5	28 - 42	2 - 3
prairie junegrass	KOMA	5	16 - 32	1 - 2	5	6 - 11	1 - 2	5	0 - 5	0 - 1	5	14 - 28	1 - 2
Indian ricegrass	ACHY	5	16 - 16	1 - 1	5	6 - 11	1 - 2	5	0 - 5	0 - 1	5	14 - 14	1 - 1
false buffalograss	MOSQ	5	0 - 16	0 - 1	5	6 - 11	1 - 2	5	9 - 14	2 - 3	5	14 - 28	1 - 2
plains reedgrass	CAMO	5	0 - 16	0 - 1	5	0 - 6	0 - 1				5	0 - 14	0 - 1
Canada wildrye	ELCA4	5	16 - 32	1 - 2							5	42 - 70	3 - 5
red threeawn	ARPUL	5	16 - 32	1 - 2	5	17 - 22	3 - 4	5	23 - 45	5 - 10	5	42 - 56	3 - 4
sandbur	CELO3				5	6 - 6	1 - 1	5	9 - 14	2 - 3	5	28 - 42	2 - 3
other perennial grasses	2GP	5	16 - 32	1 - 2	5	6 - 11	1 - 2	5	5 - 9	1 - 2	5	14 - 28	1 - 2
GRASS-LIKES		**6**	**80 - 160**	**5 - 10**	**6**	**83 - 138**	**15 - 25**	**6**	**113 - 158**	**25 - 35**	**6**	**140 - 210**	**10 - 15**
threadleaf sedge	CAFI	6	80 - 112	5 - 7	6	83 - 138	15 - 25	6	113 - 158	25 - 35	6	70 - 210	5 - 15
Penn sedge	CAPE6	6	32 - 48	2 - 3	6	6 - 11	1 - 2				6	42 - 70	3 - 5
horsetail	EQUIS	6	16 - 32	1 - 2	6	0 - 6	0 - 1				6	28 - 42	2 - 3
other grass-likes	2GL	6	16 - 32	1 - 2	7	0 - 6	0 - 1				6	0 - 14	0 - 1
NON-NATIVE GRASSES		**7**			**7**	**11 - 17**	**2 - 3**	**7**	**9 - 14**	**2 - 3**	**7**	**42 - 140**	**3 - 10**
cheatgrass	BRTE				7	0 - 17	0 - 3	7	0 - 14	0 - 3		0 - 70	0 - 5
Kentucky bluegrass	POPR											42 - 70	3 - 5
FORBS		*8*	*80 - 160*	*5 - 10*	*8*	*55 - 83*	*10 - 15*	*8*	*68 - 99*	*15 - 22*	*8*	*140 - 210*	*10 - 15*
bracted spiderwort	TRBR	8	32 - 48	2 - 3							8	0 - 14	0 - 1
bractless blazingstar	MENU	8	0 - 16	0 - 1	8	0 - 11	0 - 2				8	0 - 28	0 - 2
buffalobur	SORO				8	6 - 11	1 - 2	8	14 - 18	3 - 4	8	14 - 28	1 - 2
eriogonum	ERIOG	8	0 - 16	0 - 1	8	0 - 11	0 - 2	8	0 - 14	0 - 3	8	14 - 28	1 - 2
false gromwell	ONMO	8	0 - 16	0 - 1							8	0 - 14	0 - 1
gayfeather	LIATR	8	16 - 32	1 - 2	8	6 - 11	1 - 2	8	0 - 5	0 - 1	8	14 - 28	1 - 2
goldenrod	SOLID	8	16 - 32	1 - 2	8	6 - 11	1 - 2	8	0 - 5	0 - 1	8	14 - 28	1 - 2
green sagewort	ARDR4	8	32 - 48	2 - 3	8	22 - 28	4 - 5	8	27 - 45	6 - 10	8	28 - 42	2 - 3
hairy goldaster	HEVI4	8	16 - 32	1 - 2	8	11 - 17	2 - 3	8	14 - 18	3 - 4	8	14 - 28	1 - 2
Hood's phlox	PHHO				8	6 - 6	1 - 1	8	5 - 9	1 - 2	8	0 - 14	0 - 1
Indian breadroot	PEES	8	0 - 16	0 - 1	8	0 - 6	0 - 1				8	0 - 14	0 - 1
lemon scurfpea	PSLA3	8	16 - 32	1 - 2	8	22 - 44	4 - 8	8	36 - 45	8 - 10	8	14 - 28	1 - 2
penstemon	PENST	8	32 - 48	2 - 3	8	6 - 6	1 - 1				8	14 - 28	1 - 2
plains milkvetch	ASGI5	8	0 - 16	0 - 1							8	0 - 14	0 - 1
prairie coneflower	RACO3	8	0 - 16	0 - 1	8	11 - 17	2 - 3	8	14 - 18	3 - 4	8	14 - 28	1 - 2
purple coneflower	ECAN2	8	0 - 16	0 - 1	8	6 - 11	1 - 2				8	14 - 28	1 - 2
rush skeletonweed	LYJU	8	16 - 32	1 - 2	8	11 - 11	2 - 2	8	14 - 14	3 - 3	8	14 - 28	1 - 2
silky prairie clover	DAVI	8	16 - 32	1 - 2							8	14 - 14	1 - 1
stiff sunflower	HEPA19	8	16 - 32	1 - 2							8	14 - 28	1 - 2
sweetclover	MELIL				8	0 - 55	0 - 10	8	0 - 45	0 - 10	8	0 - 140	0 - 10
wavyleaf thistle	CIUN	8	0 - 16	0 - 1	8	6 - 11	1 - 2	8	9 - 14	2 - 3	8	14 - 28	1 - 2
western ragweed	AMPS	8	16 - 16	1 - 1	8	17 - 39	3 - 7	8	32 - 68	7 - 15	8	28 - 42	2 - 3
western wallflower	ERCAC	8	0 - 16	0 - 1	8	0 - 6	0 - 1				8	14 - 28	1 - 2
woolly Indianwheat	PLPA2				8	6 - 6	1 - 1	8	5 - 9	1 - 2	8	14 - 14	1 - 1
other perennial forbs	2FP	8	16 - 32	1 - 2	8	6 - 11	1 - 2	8	5 - 9	1 - 2	8	14 - 14	1 - 1
other annual forbs	2FA				8	6 - 6	1 - 1	8	5 - 5	1 - 1	8	28 - 42	2 - 3
SHRUBS		*9*	*32 - 80*	*2 - 5*	*9*	*28 - 39*	*5 - 7*	*9*	*36 - 68*	*8 - 15*	*9*	*70 - 98*	*5 - 7*
cactus	OPUNT	9	0 - 16	0 - 1	9	11 - 17	2 - 3	9	14 - 18	3 - 4	9	28 - 42	2 - 3
creeping juniper	JUHO2	9	16 - 16	1 - 1	9	6 - 11	1 - 2	9	9 - 14	2 - 3	9	14 - 14	1 - 1
fringed sagewort	ARFR4	9	16 - 32	1 - 2	9	17 - 22	3 - 4	9	18 - 23	4 - 5	9	14 - 28	1 - 2
leadplant	AMCA6	9	32 - 48	2 - 3	9	0 - 6	0 - 1				9	14 - 28	1 - 2
rose	ROSA5	9	16 - 32	1 - 2	9	11 - 17	2 - 3	9	9 - 14	2 - 3	9	14 - 28	1 - 2
western sandcherry	PRPUB	9	0 - 16	0 - 1							9	0 - 14	0 - 1
yucca	YUGL	9	16 - 32	1 - 2	9	11 - 17	2 - 3	9	18 - 32	4 - 7	9	28 - 42	2 - 3
other shrubs	2SHRUB	9	0 - 16	0 - 1	9	0 - 6	0 - 1	9	0 - 5	0 - 1	9	0 - 14	0 - 1

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	895 - 1424 - 1950	225 - 448 - 675	200 - 315 - 430	600 - 1141 - 1685
FORBS	75 - 120 - 165	50 - 69 - 85	65 - 83 - 100	135 - 175 - 215
SHRUBS	30 - 56 - 85	25 - 33 - 40	35 - 52 - 70	65 - 84 - 100
TOTAL	1000 - 1600 - 2200	300 - 550 - 800	300 - 450 - 600	800 - 1400 - 2000

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Sand Bluestem/Prairie Sandreed Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for proper utilization, changes in season of use and adequate recovery periods following each grazing event.

The potential vegetation is about 85% grasses or grass-like plants, 10% forbs, and 5% shrubs. Warm season grasses such as sand bluestem and prairie sandreed dominate the plant community. Other grasses and grass-like plants occurring on the site include needleandthread, blue grama, hairy grama, western wheatgrass and sedges. Significant forbs include penstemon, green sagewort, stiff sunflower, and spiderwort. Leadplant, rose and yucca are the principal shrubs.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. Waterflow patterns may not be present, but there is a very high risk of wind erosion and eventually blowouts if vegetative cover is not adequate. Cryptogamic crusts can be present, but typically only cover 1-2% of the soil surface. Some pedestalling of plants occurs, but it is not very evident on casual observation and occurs on less than 5% of the plants. Overall this site (the interpretive plant community) has the appearance of being stable and productive.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year.
Growth curve number: ND5403
Growth curve name: Missouri Slope, Native Grasslands, Warm-season dominant.
Growth curve description: Warm-season, tall/mid grass dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	4	17	40	30	8	1	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Non-use and no fire for extended periods of time will convert this plant community to the *Low Plant Density, Excessive Litter Plant Community*.
- Heavy, continuous grazing or continuous seasonal (spring) grazing will convert the plant community to the *Needleandthread/Sedge Plant Community*.
- Excessive defoliation (i.e., areas of heavy animal concentration) will convert the plant community to the *Annual/Pioneer Perennial Plant Community*.

- Cropped go-back land with continuous grazing will convert this plant community to the *Annual/Pioneer Perennial Plant Community*.

Needleandthread/Sedge Plant Community

This plant community can quickly develop from the adverse effects of long-term, heavy continuous grazing. Sand bluestem and prairie sandreed have been greatly reduced. Needleandthread and threadleaf sedge have increased and are the dominant species. Other grasses include western wheatgrass, blue grama, red threeawn, sand dropseed, Indian Ricegrass, blowout grass and prairie junegrass. Forbs such as western ragweed, green sagewort, hairy goldaster, lemon scurfpea and sweetclover may also be present. Yucca, rose, fringed sagewort and cactus have also increased.

Annual production, and consequently litter amounts, have been reduced substantially. Nutrient cycle, water cycle and energy flow are becoming impaired. This plant community is at risk of losing all tall warm season grasses. Wind scoured areas may exist where cover has been reduced or eliminated.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year.
Growth curve number: ND5411
Growth curve name: Missouri Slope, Needlegrass and Sedge.
Growth curve description: Cool-season mid grasses and short grass-likes.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	9	27	35	15	4	5	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy, continuous grazing and/or continuous seasonal (spring) grazing may cause further deterioration resulting in a shift to the *Sedge/Forb Plant Community*.
- Heavy, continuous grazing and/or excessive defoliation may shift this plant community to the *Annual/Pioneer Perennial Plant Community*.
- Non-use and no fire over an extended period of time may lead this plant community to the *Low Plant Density, Excessive Litter Plant Community*.
- Prescribed grazing that includes changing season of use and allowing adequate recovery periods to enhance cool season grasses will lead this plant community back to the *Sand Bluestem/Prairie Sandreed Plant Community (HCPC)*.

Low Plant Density, Excessive Litter Plant Community

This plant community develops after an extended period of 10 or more years of non-use by herbivores or exclusion of fire. Non-native grasses, such as Kentucky bluegrass and cheatgrass tend to invade and may dominate this plant community. Other grasses and grass-likes present include sand bluestem, prairie sandreed, little bluestem, Canada wildrye, western wheatgrass, and threadleaf sedge. The common forbs include green sagewort, goldenrod, western wallflower, prairie coneflower, western ragweed and sweetclover. Cactus and yucca are the principal shrubs.

Litter buildup reduces plant vigor and density, and native seedling recruitment declines. Due to a lack of tiller stimulation and sunlight, native bunchgrasses typically develop dead centers and native rhizomatous grasses are limited to small colonies. This plant community is dispersed throughout the pasture, encircling spot grazed areas, and areas distant from water sources. This is a typical pattern found in properly stocked pastures grazed season-long.

This plant community is resistant to change without prescribed grazing or fire. The combination of both grazing and fire is most effective in moving this plant community towards the HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in diversity.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year.
Growth curve number: ND5406
Growth curve name: Missouri Slope, Introduced Cool-season Grasses.
Growth curve description: Introduced cool-season grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	35	35	5	2	8	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing or prescribed burning followed by prescribed grazing, will move this plant community toward the *Sand Bluestem/Prairie Sandreed Plant Community*. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.

Sedge/Forb Plant Community

This plant community developed from heavy continuous grazing without adequate recovery periods between grazing events or continuous seasonal (spring) grazing. An increased amount of threadleaf sedge and forbs characterize this plant community. Sand bluestem and prairie sandreed have been reduced to negligible amounts. Other grasses and grass-likes present include sand dropseed, red threeawn, needleandthread, prairie junegrass and sandbur. Forbs commonly found in this plant community include green sagewort, lemon scurfpea, western ragweed, buffalo bur and hairy goldaster. Shrubs present include fringed sagewort and prairie rose.

Species diversity has shifted from a grass-dominated community to a forb dominated community. Production has been significantly decreased due to reduction of tall and mid-grass species. Energy flow, water cycle and mineral cycle have been negatively affected. Litter levels are very low and unevenly distributed. Soil erosion may be a concern on steeper slopes and exposed areas.

The following growth curve represents monthly percentages of total annual growth of the dominant species during a normal year.
Growth curve number: ND5408
Growth curve name: Missouri Slope, Sedge Dominant.
Growth curve description: Cool-season, short grasses and grass-likes.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	30	25	20	5	5	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy, continuous grazing and/or excessive defoliation will cause this plant community to move toward the *Annual/Pioneer Perennial Plant Community* and/or an *Active Blowout* condition.
- Long term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time move this plant community toward the *Needleandthread/Sedge Plant Community*. Eventually the plant community may return to the *HCPC* or associated successional plant community stages assuming an adequate seed/vegetative source is available. This process may take greater than 20 years.

Active Blowout

Heavy continuous grazing, excessive defoliation, disturbance (tillage, etc.) and/or wildfire brings about this condition. Continuous grazing will only increase the size of the blowouts. This condition is not stable. It consists of bare areas that are continually eroded by wind.

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing and concentrated animal impact (such as feeding hay on the blowout), will begin to heal the blowout and provide an opportunity for the *Annual/Pioneer Perennial Plant Community* to establish.
- Removal of disturbance followed by range seeding, which can include mulching, followed by long term prescribed grazing can be used to convert this plant community to one that may resemble the *HCPC*.

Annual/Pioneer Perennial Plant Community

This plant community develops under severe disturbance and/or excessive defoliation. This can result from heavy livestock or wildlife concentration, and cropping abandonment (go-back land). The dominant vegetation includes pioneer annual grasses, forbs, invaders, and early successional biennial and perennial species. Grasses may include red threeawn, crested wheatgrass, annual brome, needleandthread, sand dropseed, blowout grass, sandbur, Scribner's Panicum and little bluestem. The dominant forbs include curlycup gumweed, marestail, salsify, kochia, thistles, western ragweed, pussytoes, prostrate verbena and other early successional species. Shrubs that may be present include prairie rose, fringed sagewort and broom snakeweed. Plant species from adjacent ecological sites may become minor components of this plant community. The community also is susceptible to invasion of non-native species due to severe soil disturbances and relatively high percent of bare ground. Many annual and perennial forbs, including non-native species, have invaded the site.

This plant community is resistant to change, as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession. Soil erosion is potentially high.

Significant economic inputs, management and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new plant community.

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy, continuous grazing and/or excessive defoliation will cause this plant community to move toward an *Active Blowout* condition.
- Long-term prescribed grazing and removal of disturbance, including adequate rest periods, will move this community through the successional stages, and may eventually lead to a plant community resembling the *Sand Bluestem/Prairie Sandreed Plant Community (HCPC)* or associated successional plant communities assuming an adequate seed/vegetative source exists. This process will likely take a long period of time (50+ years).
- Range seeding followed with prescribed grazing can be used to convert this plant community to one that may resemble the *HCPC*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Sand Bluestem/Prairie Sandreed Plant Community:

Needleandthread/Sedge Plant Community:

Sedge/Forb Plant Community:

Low Plant Density, Excessive Litter Plant Community:

Annual/Pioneer Perennial Plant Community:

Active Blowout Plant Community:

Animal Preferences (Quarterly – 1,2,3,4†)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
rasses & Grass-likes							
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
cheatgrass	U D U U	N P U N	U D U U	N P U N	N P U N	U D U U	U D U U
false buffalograss	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
hairy grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
horsetail	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Indian ricegrass	D P U D	N P N D	D P U D	N P N D	N P N D	D P U D	D P U D
Kentucky bluegrass	U D U U	U P N D	U D U U	U P N D	U P N D	U D U U	U D U U
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
Penn sedge	U P U D	U P N D	U P U D	U D U D	U D U D	U P U D	U P U D
plains reedgrass	U D U U	N D N N	U D U U	N D N N	N D N N	U D U U	U D U U
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
red threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
sand bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
sand dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
Scribner panicum	U U D U	N U N N	U U D U	N U N N	N U N N	U U D U	U U D U
threadleaf sedge	U D U D	U P N D	U D U D	U D U D	U D U D	U D U D	U D U D
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
bracted spiderwort	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
bractless blazingstar	N N U N	N N U N	N N U N	N N U N	N N U N	N N U N	N N U N
eriogonum	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
false gromwell	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
Indian breadroot	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
lemon scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
penstemon	U U U U	U P P U	U U U U	U P P U	U P P U	U U U U	U P P U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
silky prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
stiff sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
wavyleaf thistle	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western ragweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
western wallflower	U D U U	N U U N	U D U U	N U U N	N U U N	U D U U	N U U N
rubs							
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
creeping juniper	U N N U	U N N U	U N N U	U N N U	U N N U	U N N U	U N N U
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
western sandcherry	D P P D	D U U D	D P P D	P U D P	D U U D	D P P D	P U U P
yucca	D N N D	D U U D	D N N D	D U U D	D U U D	D N N D	D U U D

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended.* These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process and may need to be adjusted due to diet preferences of other types or kinds of livestock and/or other factors. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Production (lbs./acre)	Carrying Capacity [1] (AUM/acre)
Sand Bluestem/Prairie Sandreed (HCPC)	1600	0.50
Low Plant Density, Excessive Litter	1400	0.44 [2]
Needleandthread/Sedge	550	0.17
Sedge/Forb	450	0.14
Annual/Pioneer Perennial	-- [3]	-- [3]
Active Blowout	-- [3]	-- [3]

[1] Continuous season-long grazing by cattle under average growing conditions.
[2] Stocking rates may need to be adjusted due to palatability and/or availability of forage.
[3] Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic group A. Infiltration varies from rapid to very rapid and runoff potential varies from negligible to very low depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

Seed harvest of native plant species can provide additional income on this site.

Supporting Information

Associated Sites

(054XY025ND) – Sands
(054XY042ND) – Sandy Terrace
(054XY043ND) – Shallow Sandy
(054XY045ND) – Limy Sands
(054XY035ND) – Very Shallow

Similar Sites

(054XY026ND) – Sandy (Sy)
[Does not receive additional moisture. Found on dry uplands upslope from sandy terraces or loamy overflow sites, down slope from limy sands or shallow sandy sites. Similar landscape position as loamy, sands, clayey sites; will ribbon up to 1 inches. Indicator species are prairie sandreed with western wheatgrass and green needlegrass intermixed. This site has more production, thicker “A” horizon and a mollic epipedon, lime deeper than 6 inches from the surface, less little bluestem, plains muhly, sideoats grama, more prairie sandreed, different landscape positions]

(054XY042ND) – Sandy Terrace (SyT)
[Well drained soils on a river or stream terrace in a position that will flood occasionally (once in ten years) with no apparent water table. Indicator species are prairie sandreed evenly mixed with sand bluestem, some Canada wildrye, penstemon, and leadplant and/or western snowberry, and with possible trees. This site has more production, thicker “A” horizon and a mollic epipedon, no little bluestem, plains muhly, more prairie sandreed, green needlegrass and shrubs or trees, can be in the same landscape positions, but has more potential to receive additional moisture through occasional flooding.]

(054XY025ND) – Sands (Sa)
[Does not receive additional moisture. Found on dry uplands, upslope from sandy terraces or loamy overflow sites, down slope from limy sands or shallow sandy sites. Similar landscape position as loamy, sandy, and clayey sites. Won’t form a ribbon; indicator species are sand bluestem and prairie sandreed evenly mixed, some Canada wildrye, penstemon, and leadplant and western snowberry. This site has far more production, thicker “A” horizon and a mollic epipedon, less needleandthread, less choppy landscape.]

(054XY043ND) – Shallow Sandy (SwSy)
[Some what excessively drained soils more than 10 less than 20 inches to sedimentary sandstone bedrock and/or gravels that restricts root penetration. Surface layer will ribbon less than 1 inch unless above gravels than more than 1 but less than 2 inches. Upslope from thin loamy, limy sands, sands or sandy sites and some times down slope form very shallow ecological sites. Indicator species: little bluestem, prairie sandreed, sand bluestem, and needle grasses, with dotted gayfeather, pasqueflower, purple coneflower and purple prairie clover, and shrubs like prairie rose and yucca. This site has similar production, more little bluestem, sand bluestem, sedges and blue grama, less needleand-thread, restrictive layer within twenty inches.]

(054XY045ND) – Limy Sands (LSa)
[Moderately deep entisol, usually calcareous within 4 inches to the surface, found on knobs and/or sideslopes of hills and buttes; will not form a ribbon; up slope of sands or sandy and down slope from shallow sandy ecological sites. Indicator species: Little bluestem, sand bluestem, and prairie sandreed, along with penstemon, silverleaf scurfpea, purple coneflower, yucca, creeping juniper, and leadplant. This site has similar production with a thin “A” horizon, no mollic epipedon, but has lime within 6 inches to the surface, more little bluestem, plains muhly, sideoats grama, less prairie sand reed and sand bluestem, different landscape positions.]

Inventory Data References

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field tested by various private, State and Federal agency specialist.

Those involved in developing this site description include: Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; Stan Boltz, NRCS Range Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; L. Michael Stirling, NRCS Range Management Specialist; David Dewald, NRCS State Biologist; and Brad Podoll, NRCS Biologist.

Data Source	Number of Records	Sample Period	State	County
SCS-RANGE-417	1	1969	ND	Mercer

State Correlation

This site has been correlated with Montana and South Dakota in MLRA 54.

Field Offices

Baker, MT	Buffalo, SD	Faith, SD	Mott, ND
Beach, ND	Carson, ND	Hettinger, ND	Selfridge, ND
Beulah, ND	Culbertson, MT	Killdeer, ND	Sidney, MT
Bison, SD	Dickinson, ND	Mandan, ND	Watford City, ND
Bowman, ND	Dupree, SD	McIntosh, SD	Wibaux, MT

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43a – Missouri Plateau.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)
USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)
USDA, NRCS. National Range and Pasture Handbook, September 1997
USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (http://nasis.nrcs.usda.gov)
USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

_____ _____
State Range Management Specialist Date

_____ _____
State Range Management Specialist Date

_____ _____
State Range Management Specialist Date